ATTACHMENT 13

PROCESS CONTROL EQUIPMENT

Description of Waste Feed Cut Off

Waste feed cut off for the upgraded deactivation furnace (APE 1236) is controlled by an Allen-Bradley SLC 5/05 programmable logic controller (PLC).

The rotary kiln feed end and afterburner outlet temperatures are monitored by the PLC. Alarm set points are stored in the PLC memory registers. When the monitored temperature exceeds the specified limits, waste feeding is stopped. The baghouse temperature is monitored by the PLC and alarms in the same way.

The draft pressure at the outlet of the afterburner is monitored by the PLC. The draft pressure at the feed end of the retort is monitored by the PLC. When alarm set points are exceeded, the feeding stops. The baghouse differential pressure transmitter is monitored by the PLC and when alarm conditions exist, the feeding stops.

Auxiliary contacts on all of the fan motors determine the alarm status. When a fan motor fails, the waste feeding stops.

Motion sensors determine the alarm status of the two conveyors. The rotary kiln rotation is also monitored. When motion stops, the PLC stops the feeding process.

Auxiliary contacts on the two double tipping valves determine the alarm status of the baghouse and cyclone motors. Feeding stops when a double tipping valve fails.

The PLC continually monitors for WFC errors and WonderWare reports the status of the screen. When errors occur, PLC stops the feeding process and sends a signal to the WonderWare. At the same time visual and audible alarms activate. The IPC also monitors the PCOS to determine if it is operating.

The CEMS equipment monitors the CO emissions from the stack. The CO level is communicated to the PLC. The PLC corrects the CO level to 7% oxygen. When the corrected CO level rises above 100 ppm, the feeding stops.

When the weight on the scale exceeds the maximum levels, the waste feed rate monitoring system will not function (feeding stops).

Parameters recorded on the hard drive:

1. Rotary kiln feed end temperature (EF)
2. Rotary kiln burner end temperature (EF)
3. Burner flameout
4. Kiln rotation (rpm)
5. Kiln pressure (inches W.C.)
6. Afterburner temperature (EF)
7. Afterburner flameout
8. Baghouse inlet temperature (EF)
9. Baghouse differential pressure (inches W.C.)
10. CO low range corrected value (ppm)
11. CO high range corrected value (ppm)

12. O_2 level (%)
13. Stack gas emission velocity (ft/s)
14. Stack outlet temperature (EF)
15. Fuel oil consumed (running total) (gal)
16. Feed rate, hourly avg. (lb/hr)
17. Emergency stop status

These readings are taken in the following manner:

CO is recorded every second in the PLC and recorded permanently in the computer data bank. The readings are averaged every minute and the PLC computes an hourly rolling average.

Waste Feed Rate inputs are monitored continuously. Hourly average will be calculated and recorded every push off.

Stack Gas Temperature and Stack Gas Velocity are continuously read and recorded every minute in the data bank.

Currently, the only available options for the baghouse monitoring are ΔP monitoring and manual inspection of the baghouse. A more detailed description of the ΔP operation and a reference to inspection frequency are given below.

The data recorded on the hard drive is archived on ZIP disks or similar device.

BAGHOUSE FILTER ELEMENT MONITORING:

Baghouse filter element condition monitoring is done by watching the ΔP value across the baghouse. ΔP is solely dependent upon the air flow resistance through the filter elements.

ΔP is the difference in pressure measured across the baghouse taken on each side of the filter elements. Both readings are negative values created by the draft fan and measured in inches of water with the outlet side having the greater negative value. Too high of a reading indicates plugged or "blinded" condition in which filter element material becomes permanently coated with combustion residue and the pulse-jet cleaning cycle cannot release the material. Too low of a reading indicates an open element condition indicating a breach in the baghouse material. An experienced operator will know the "Steady State" ΔP reading during normal furnace operation and filter element cleaning cycles and will know immediately if an abnormal change occurs such as filter blinding or a breach in the filter element. An operator knowing the steady state reading of his furnace can easily monitor filter element condition.

ΔP can be accurately measured using any of several commercially available gauges on the market. Three of the most common and easily available gauges are; PHOTOHELIC gauge, MAGNEHELIC gauge, and the common manometer which will be used as required. All of these gauges take a reading at each side of the baghouse tube sheet.

FILTER MATERIAL:

The filter elements are made from Cerafil XS-3000 ceramic material.

INSPECTION SCHEDULE:

The entire APE-1236 furnace system receives a complete visual inspection prior to each start-up. The periodic checks and services specified in the Preventative Maintenance Section of the current Operation Manual will be performed. The minimum Preventative Maintenance Service outlined in Table 13-1 below will be performed.

Table 13-1
Preventive Maintenance Service

DESCRIPTION	INTERVAL	PROCEDURE
Lubricate	In accordance with Operation Manual	In accordance with Operation Manual
Fuel Supply	Before start-up	Ensure adequate fuel supply for current job.
Propane	Before start-up	Ensure adequate fuel supply for current job.
Enclosure Door Seals	Monthly	Ensure a weather tight seal.
Enclosure Lights	Daily	Condition
Waste Feed Monitor	Weekly	Test by placing a test weight (10% over max.) and ensuring that the red over-limit indicator light comes on and the system automatically prevents feeding.
Calibrate Gas Monitoring System	Each usage	System checks itself during each start-up.
Archive data on hard disk	Monthly or as required	Ensure all necessary data is archived prior to exceeding the capacity of the hard disk.
Air Compressor	Daily	
Check automatic drain system.Feed Conveyor	Monthly	Check/adjust support rollers, links, bearings, sprockets, and associated hardware.

Discharge Conveyor	Monthly/Daily	Check/adjust support rollers, links, bearings, sprockets, and associated hardware. Remove foreign metal/material daily.
Retort Chains	Monthly	Check/adjust retort drive chains, bearings, and sprockets. Replace as required.
Draft Fan Drive Belts	Bi-monthly	Check/adjust drive belts. Replace as necessary.
Cyclone and Baghouse Double Tipping Valves	Monthly	Ensure that the hopper is not clogged and that the valves work freely.
Retort Vari Drive	Bi-annually	Inspect Vari-Drive belt (internal). Replace as necessary.
Baghouse	As indicated by change in baghouse pressure	Inspect bag condition by opening the access door and visually inspecting elements for excess contamination (blinding) or holes. Replace individual elements as required.

CALIBRATION SCHEDULE:

Table 13-2 summarizes the calibration schedule for the APE-1236 furnace system instruments. In all cases, the minimum frequency of calibration will be at least that recommended by the manufacturer.

Each instrument will be calibrated according to the procedures recommended by the manufacturer. These written procedures will be maintained on-site. Each calibration will be documented on log sheets. Each log sheet will clearly identify the instrument being calibrated, the date of calibration and the signature of the person performing the calibration. It will include the settings/readings prior to any adjustments, any adjustments made to the instrument, and any other information recommended to be checked by the manufacturer for that particular instrument. Any unusual findings discovered as part of the calibration will also be noted on the calibration logs. If any problems need to be corrected or any repairs made to the instrument, a work order will be generated.

A separate maintenance file will be maintained for each instrument/monitor. The file shall contain all work, maintenance, calibration, testing, and inspection data as required for each instrument.

Table 13-2
Calibration Schedule

DESCRIPTION	MEASUREMENT DEVICE	MANUFACTURER	MODEL NUMBER	CALIBRATION FREQUENCY
baghouse Δp	pressure transmitter/differential pressure, 0-15" WC	Foxboro	IDP10-D22A11FM1B1	annually
system draft pressure	pressure transmitter/gage pressure, 0-5" WC	Foxboro	IGP20-D12A11FM1B1	annually
rotary kiln feed end draft	pressure transmitter/gage pressure, 0-0.5" WC	Foxboro	IGP20-D12A11FM1B1	annually
rotary kiln feed end temperature	panelmeter, thermocouple with transmitter	Newport	INFCT-0001	annually
afterburner temperature	panelmeter, thermocouple with transmitter	Newport	INFCT-0001	annually
baghouse inlet temperature	panelmeter, thermocouple with transmitter	Newport	INFCT-0001	annually
baghouse outlet temperature	panelmeter, thermocouple with transmitter	Newport	INFCT-0001	annually
rotary kiln burner end temperature	panelmeter, thermocouple with transmitter	Newport	INFCT-0001	annually
stack air flow	insertion mass flow meter Series 454FT	Kurz	756004-13-23-00-0000-13-14-01-28-20-01-12	annually
stack temperature	insertion mass flow meter Series 454FT	Kurz	756004-13-23-00-0000-13-14-01-28-20-01-12	annually
O_2 monitor	see Attachment 15	Southern Technologies	see Attachment 15	daily, quarterly, annually
CO monitor	see Attachment 15	Southern Technologies	see Attachment 15	daily, quarterly, annually
CO monitor	see Attachment 15	Southern Technologies	see Attachment 15	daily, quarterly, annually
waste feed scale	explosion proof electronic platform scale, 71.7 lb	Sartorius	F32000S-X	weekly